

## The Cost of Golf Course Construction

**I**N the August issue of THE GOLF COURSE we announced for an early date a series of discussions on the cost of constructing a first class golf course and at that time we appealed to our readers for their assistance in supplying the necessary data to make the discussion as valuable as possible.

We have received an exceedingly interesting and exhaustive report from the Scioto Country Club, Columbus, Ohio, which takes up in very great detail the cost of each portion of the course together with a very careful description of the methods and materials used. The directors of the club have very kindly given us their permission to discuss their report in the hope that their experience will be of value to those contemplating the construction of new courses.

The work at the Scioto Country Club was subject to more than the usual labor difficulties and in addition the extremely unseasonable weather which was experienced during the Summer made it impossible to obtain as great efficiency at all times as might otherwise be expected. The work was delayed and much additional expense was incurred on account of rains, which were unprecedented in the history of the local weather bureau. The excessive rainfall, in addition to increasing the labor problem, caused much loss through the washing out of various greens and fairways and the total cost of construction is conservatively estimated to have been increased by about thirty per cent. However, the committee in charge of the work believes that the very wet season had its favorable side in that it gave great experience with drainage conditions and caused many precautions to be taken which saved much future expense and inconvenience in case the trouble had developed after the opening of the course.

Space this month will not permit us to go into any detail regarding the Committee's report, but in the next issue of

THE GOLF COURSE we will present a careful study of the whole work and take up the various items of cost.

The response to our request for assistance from our readers in this discussion has been very gratifying, but we are anxious to get still more data from as many different localities as possible. We feel sure that nearly every country club can supply much information which will be of great value to the golfing world and we greatly hope that a large number of our readers will take time to aid us in this work.

## The Covering of Putting Greens for the Winter

By LEONARD MACOMBER

**I**T must first of all be understood that turf does not suffer much from the cold Winter weather. Therefore, it is not necessary to protect putting greens with any heavy blanket covering of straw, manure, or leaves.

Winter killing takes place usually in the late Winter or early Spring season where the surface drainage is not correct, and in the low spots, any standing water alternately freezes and thaws.

Of course, on very exposed positions, turf often suffers from the cold winds and ice, and it is advisable to use some artificial means to help matters—such as the laying of clean branches around the greens and sometimes on them, so as to help collect the snow. A covering of snow has a very beneficial effect on turf, as it protects it from extreme temperatures, cold winds and keeps it comparatively warm and with the final Spring thaw, the soil has an abundant supply of moisture.

It is always well to top-dress putting greens late in the Fall, just before the cold weather becomes settled, with a quarter to half-inch layer of sand or compost, depending upon the nature and condition of the soil, and sometimes add charcoal for sweetening. Work the dressing into the existing turf with birch brooms or the backs of rakes and

roll if the ground is not frozen.

This quarter-inch covering, while not absolutely necessary serves as a protection for the roots of the grass plants, and at the same time, working into the soil improves its mechanical condition.

There are a few golf clubs who, after top-dressing their greens, make a practice of covering them with a very thin layer of clean straw through which the turf can easily be seen—the idea being to help prevent the ground from thawing out in the middle of the day during moderate weather and freezing again at night.

This sort of covering is all right where conditions are severe, but it is fatal to apply any heavy covering of straw or manure, as the turf becomes tender, and in the early Spring, when the covering is removed, the turf is easily killed by an unexpected return of cold weather and frost.

## Grass Diseases

(Continued from the September Issue)

### II.—RUST GROUP

We now come to another group called the *Puccinia*, which causes the well-known rust on grass. This is a more troublesome group of fungi, as it attacks the leaves and stems of grasses in all stages of their growth, even when growing strongly under good conditions. Nearly all greens and lawns will show a more or less badly rusted patch of grass in a dry Spring or at the end of a dry Summer; in fact, it is the most widely-distributed of all fungoid pests, attacking corn, tea, coffee plants, and chrysanthemum, etc., and attacks nearly a hundred species of grass.

The commonest form of rust found on grass is *Puccinia avenæ*, found on foxtail, tall oat grass, and cocksfoot. *Puc. airæ* is found on *Aira cæspitosa* on open heath lands; whilst *Puc. agrostides* is nearly always found on *Agrostis alba* and *A. canina*. I have seen large patches of both these grasses attacked by rust on Wimbledon Common; and on Horsell Heath, near Woking, several varieties of grasses

will be seen infested with various rusts. *Puc. poæ* confines itself to the various *Poas*, and will be seen on *Poa pratensis* and *Poa compressa*, even when these are shaded by trees. Another rust, *Puc. coronifera*, produces the spores in the form of a small crown on the leaves of foxtail, rye grass, tall fescue, Yorkshire fog, etc. In America Timothy is commonly attacked by *Puc. Phleii pratensis*, but it is comparatively rare in this country. Several of these Rusts also grow on buttercups, nettles and docks. It is, therefore, desirable to keep these weeds down as much as possible whenever the grass appears liable to attacks of rust. A usual sign of turf being infested by rust is in the turf turning a dingy brown or gray color, which afterwards becomes white as the stems and leaves die and get bleached. Directly these patches are noticed a mixture of copper sulphate, lime and water should be applied, if it is late in the season; or permanganate of potash (using a quarter-ounce to five gallons of water) if the rust occurs in the spring.

There is another disease allied to the rusts that causes long brown stripes on barley as well as grass leaves: this may be called the "grass leaf stripe," *Pyrenophora trichostoma*. It was found to have broken out very badly in Norfolk and eastern counties in 1908, and I came across specimens of *Poas* cocksfoot, Sheep's fescue, tall oat grass, &c., all badly diseased. It is presumed that the disease was spread in that year by the large quantity of cut hay left lying on the fields during the two previous bad haymaking years: and it certainly seems that where cut grass is left on the ground the spread of disease is hastened, more especially amongst the *Poas* and softer meadow grasses.

The next group of fungoid diseases are the Mildews. Although there are several of these that attack grasses, the commonest species is a white powder-like Mildew, *erysiphe graminis*, which grows on several grasses, and can be found in almost any hedgerow during